

**USE OF A SUBSTANCE P ANTAGONIST IN A COSMETIC  
COMPOSITION, AND THE COMPOSITION THUS OBTAINED**

The invention concerns the use of a substance P antagonist in a cosmetic composition used to treat sensitive skin. More specifically, the invention relates to a substance P antagonist used to prevent and/or combat skin irritations, desquamation, erythemas, sensations of dysesthesia/overheating, or pruritus of the skin.

The present invention concerns the use of a substance P antagonist in a cosmetic composition used to treat sensitive skin, and the cosmetic composition obtained.

It is known that some skin is more sensitive than others. Until now, the symptoms of sensitive skin were poorly characterized, and, accordingly, the problem of sensitive skin was poorly defined. No one knew exactly what process was implicated in skin sensitivity. Some specialists thought that sensitive skin reacted to cosmetic products, while others felt sensitive skin reacted to a number of external factors not necessarily associated with cosmetics.

A number of tests were conducted to attempt to identify sensitive skin. For example, these tests made use of lactic acid and DMSO, which are known irritants. (See, for example, the article by K. Lammintausta et al., Dermatoses, 1988, 36, pages 45-49, and the article by T. Agner and J. Serup, Clinical and Experimental Dermatology, 1989, 14, pages 214-217.) However, these tests did not make it possible to characterize sensitive skin.

In addition, sensitive skin was held to resemble allergic skin.

Because the characteristics features of sensitive skin were poorly known, treatment has proved very difficult until now. Skin was treated indirectly, for example, by restricting the use of irritating products such as surfactants, preservatives, and perfumes in cosmetic compounds.

The Applicant conducted numerous clinical tests and was able

to determine the symptoms shown in sensitive skin. These symptoms are, in particular, subjective in nature, i.e., basically sensations of dysesthesia. These are more or less painful sensations in a skin area, e.g., tingling, prickling, itching or pruritus, burning, overheating, discomfort, tugging sensations, etc.

The Applicant was also able to show that sensitive skin was not allergic skin. Indeed, allergic skin reacts to an external agent, i.e., an allergen, which triggers an allergic reaction. This is an immunological process which occurs only when an allergen is present and which does not affect sensitized subjects. In the Applicant's view, the basic feature of sensitive skin is, on the contrary, a response mechanism to external factors which may affect any individual, even though individuals considered to have sensitive skin react faster than others. This mechanism is not immunological, but aspecific.

The Applicant has since discovered that sensitive skin could be divided into two major clinical groups, irritable and/or reactive skin, and intolerant skin.

An irritable and/or reactive skin reacts by means of pruritus, that is, by itching or tingling, to various factors such as the environment, emotion, food, wind, friction, shaving, soap, surfactants, hard water having a high limestone concentration, temperature variations, or wool. In general, these signs are associated with dry skin with or without desquamation, or with skin exhibiting erythema.

Intolerant skin reacts by producing sensations of overheating, tugging, prickling, and/or redness to various factors such as the environment, emotion, and food. In general, these signs are associated with skin exhibiting hyperseborrhea or acne, with or without desquamation, and with erythema.

"Sensitive" scalp has a more pathognomonic clinical semiology: the sensations of pruritus and/or tingling or overheating are triggered basically by localized factors, such as rubbing, soap, surfactants, hard water containing a high limestone concentration, shampoos or lotions. These sensations are sometimes triggered by factors such as the environment, emotion, and/or food. Erythema and hyperseborrhea of the scalp, as well as the presence and extent of dandruff, are frequently associated with the aforementioned signs.

Furthermore, in some anatomical regions such as the major bend areas (the inguinal, genital, axillary, popliteal, and submammary regions and the bend of the elbow) and the feet, sensitive skin leads to pruriginous and/or sensations of dysesthesia (overheating, tingling) linked, in particular, to sweat, rubbing, wool, surfactants, hard water containing high limestone concentrations, and/or to temperature variations.

To determine whether a particular skin is sensitive or not, the Applicant also perfected a test. In fact, after conducting a large number of tests for the purpose of defining sensitive skin, the Applicant found, surprisingly, that there was link between persons having sensitive skin and those who reacted to a topical application of capsaicin.

The capsaicin test is performed by applying, over approximately 4 cm<sup>2</sup> of skin, 0.05 ml of a cream containing capsaicin in a concentration of 0.075% and by noting the appearance of subjective signs caused by this application, such as tingling, burning, and itching. In subjects with sensitive skin, these signs appear at between 3 and 20 minutes following application, and are followed by the appearance of an erythema, which begins at the periphery of the area of application.

To date, capsaicin has been used as a drug, in particular to treat the pain arising from shingles. Capsaicin causes the release of neuropeptides, in particular tachykinins, which emanate from nerve ends in the epidermis and dermis. The Applicant found that the physiopathological process common to all states of sensitive skin was linked to a pronounced ability to release tachykinins, and, more specifically of substance P, in the skin. The manifestations of dysesthesia caused by their release are termed "neurogenic."

Substance P is a chemical polypeptide produced and released by nerve endings. It belongs to the group of tachykinins. Substance P acts in particular in pain transmission and in diseases of the central nervous system, such as anxiety and schizophrenia, in respiratory, inflammatory, gastrointestinal, and rheumatic diseases, and in certain skin disorders, such as eczema.

The Applicant has now discovered that the basic characteristic of sensitive skin is linked to the release of substance P, and thus, that the use of substance P antagonists could produce a

preventive and/or curative effect on sensitive skin.

To treat sensitive skin, the Applicant thus contemplated the use of substance P antagonists. Indeed, the Applicant found, surprisingly, that the incorporation of a substance P antagonist in a cosmetic compound made it possible to prevent irritation, sensations of dysesthesia, and pruritis in the skin.

Therefore, the present invention concerns the use of a substance P antagonist in a composition containing a cosmetically-acceptable medium in order to treat sensitive skin.

The present invention further relates to the use of a substance P antagonist to prevent and/or combat skin irritations, desquamation, erythemas, sensations of overheating or of dysesthesia, and/or pruritis in the skin.

A cosmetically-acceptable medium is a medium compatible with the skin, the nails, and the hair. The composition containing the substance P antagonist may be applied on the face, the neck, the hair, and the nails, or any other cutaneous region of the body.

To be acknowledged as a substance P antagonist, a substance must possess the following characteristics:

- a selective affinity for the NK1 receptors on the tachykinins;
- a pharmacological substance P-antagonist action; that is, it must induce a consistent pharmacological response in at least one of the following two tests:

- the antagonist substance must reduce the extravasation of plasma through the vascular wall caused by the capsaicin

or by antidromic nerve excitation, or else

- the antagonist substance must cause inhibition of the contraction of the smooth muscles caused by administration of substance P.

To date, substance P antagonists have been used to treat the diseases indicated above. To this end, reference may be made to the following documents; US-A-4472305, US-A-4839465, EP-A-101929, EP-A-333174, EP-A-336230, EP-A-394989, EP-A-443132, EP-A-498069, EP-A-515681, EP-A-517589, WO-A-92/22569, GB-A-2216529, EP-A-360390, EP-A-429366, EP-A-430771, EP-A-499313, EP-A-514273, EP-A-514274, EP-A-514275, EP-A-514276, EP-A-520555, EP-A-528495, EP-A-532456, EP-A-545478, EP-A-558156, WO-A-90/05525, WO-A-90/05729, WO-A-91/18878, WO-A-91/18899, WO-A-92/12151, WO-A-92/15585, WO-A-92/17449, WO-A-92/20676, WO-A-93/00330, WO-A-93/00331, WO-A-93/01159, WO-A-93/01169, WO-A-93/01170, WO-A-93/06099, WO-A-93/09116, EP-A-522808, and WO-A-93/01165.

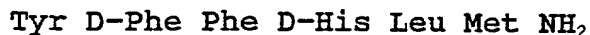
To date, no one had established a link between substance P and sensitive skin. The clinical signs of sensitive skin are basically subjective: tingling, pricking, pruritis, tugging, and overheating, and they are sometimes associated with erythema. These signs are produced by aspecific external factors. The symptoms are essentially localized on the face, the neck, and the scalp, but may also appear over the entire body.

The substance P antagonist according to the invention may be a peptide or a nitrogenous non-peptide derivative, and, more specifically, a compound comprising a nitrogenous heterocyclic

compound or an atom of nitrogen bonded directly or indirectly to a benzene ring.

In accordance with the invention, use may be made, of example, of sendide or spantide II as a substance P antagonist peptide.

Sendide corresponds to the formula:



wherein:

Tyr is tyrosine

D-Phe is D-phenylalanine,

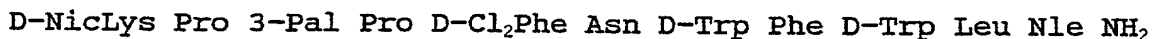
Phe is phenylalanine,

D-His is D-histidine,

Leu is leucine, and

Met is methionine.

Spantide II corresponds to the formula:



wherein:

D-NicLys is D-lysine nicotinate,

Pro is proline

3-Pal is 3-pyridylalanine,

D-Cl<sub>2</sub>Phe is D-dichlorophenylalanine,

Asn is asparagin,

D-Trp is D-tryptophan,

Phe is phenylalanine,

Leu is leucine, and

Nle is nor-leucine.

According to the invention, the substance P antagonist peptide



may also include the peptides described in the following documents: US-A-4472305, US-A-4839465, EP-A-101929, EP-A-333174, EP-A-336230, EP-A-394989, EP-A-443132, EP-A-498069, EP-A-515681, EP-A-517589, WO-A-92/22569, and GB-A-2216529.

Non-peptide substance P antagonists that can be used according to the invention include, in particular, compounds containing an atom of nitrogen bonded directly or indirectly to a benzene ring or contained in a heterocyclic compound.

As heterocyclic compound, use may be made according to the invention of those heterocyclic compounds described in the following documents: EP-A-360390, EP-A-429366, EP-A-430771, EP-A-499313, EP-A-514273, EP-A-514274, EP-A-514275, EP-A-514276, EP-A-520555, EP-A-528495, EP-A-532456, EP-A-545478, EP-A-558156, WO-A-90/05525, WO-A-90/05729, WO-A-91/18878, WO-A-91/18899, WO-A-92/12151, WO-A-92/15585, WO-A-92/17449, WO-A-92/20676, WO-A-93/00330, WO-A-93/00331, WO-A-93/01159, WO-A-93/01169, WO-A-93/01170, WO-A-93/06099, and WO-A-93/09116. In particular, the compound containing at least one nitrogenous heterocyclic compound is a derivative of 2-tricyclyl-2-aminoethane, a derivative of spiro lactame, a derivative of quinuclidine, an azacyclic derivative, a derivative of aminopyrrolidine, a derivative of piperidine, an aminoazaheterocyclic compound, or a derivative of isoindole.

As regards compounds containing a nitrogen atom bonded directly or indirectly to a benzene nucleus, mention may be made of those described in the following documents: EP-A-522808 and WO-A-

93/01165.

In the compositions according to the invention, the substance P antagonist is preferably used in a quantity ranging from 0.000001 to 5% by weight of the total weight of the composition, and, in particular, in a quantity ranging from 0.0001 to 0.1% by weight of the total weight of the composition.

The compositions according to the invention may be present in all galenical forms normally used for topical application, in particular solutions or dispersions of the lotion or serum type, liquid or semi-liquid milk emulsions produced by dispersion of a fatty phase in an aqueous phase (H/E) or the reverse (E/H), or cream- or gel-type emulsions having a soft consistency, or microgranulates or vesicular ionic and/or non-ionic dispersions. These compositions are prepared according to conventional practice.

They may also be used for hair, in the form of alcoholic or hydroalcoholic aqueous solutions or as creams, gels, emulsions, or foams, or again, as aerosol compositions also containing a pressurized propulsive agent.

The quantities of the various constituents in the compositions according to the invention are those conventionally used in the fields of study under consideration.

These compositions make up, in particular, creams for cleansing, protecting, treating, or caring for the face, the hands, the feet, the major anatomical bending areas, or for the body (e.g., day and night creams, make-up removal creams, foundation creams, and sunscreens), liquid foundations, make-up removal

lotions, protective or skin-care body lotions, sunscreen lotions, skin-care lotions, gels, or foams, such as cleansing, sunscreen, and artificial tanning lotions, bath preparations, deodorant compositions containing a bactericide, after-shave gels or lotions, depilatory creams, and compositions used for insect stings and against pain.

The compositions according to the invention may also consist of solid preparations used for soaps and cleansing bars.

In addition, these compositions can be packaged as aerosol compositions also containing a pressurized propulsive agent.

The substance P antagonist may also be incorporated into various hair-care compositions, in particular shampoos, setting lotions, treatment lotions, hair creams or gels, coloring compositions (in particular oxidation dyes) potentially in the form of coloring shampoos, restructuring lotions for the hair, permanent compositions (in particular compositions for the first stage of a permanent), anti-hair loss lotions and gels, etc.

The cosmetic compositions according to the invention may also be used by mouth, e.g., in toothpastes. In this case, the compositions can contain conventional additives for compositions taken by mouth, in particular surfactants, thickeners, wetting agents, polishing agents such as silica, various active ingredients such as fluorides, in particular sodium fluoride, and potentially, sweeteners such as sodium saccharinate.

When the composition according to the invention is an emulsion, the proportion of the fatty phase may range from 5% to

80% by weight, and preferably from 5% to 50% by weight of the total weight of the composition. The oils, emulsifiers, and coemulsifiers used in the emulsion are chosen among those conventionally used in the cosmetic field. The emulsifier and coemulsifier are present in the composition in a proportion of between 0.3% and 30% by weight, and preferably between 0.5% and 30% by weight of the total weight of the composition. Moreover, the emulsion may contain lipidic vesicles.

In conventional fashion, the cosmetic composition according to the invention may also contain additives customarily used in cosmetics, such as water-absorbent or lipophilic gelling agents, water-absorbent or lipophilic active ingredients, preservatives, antioxidants, solvents, perfumes, fillers, screens, and coloring substances. The quantities of these various additives are those conventionally used in cosmetics; for example,, from 0.01% to 10% of the total weight of the composition. These additives may, depending on the nature thereof, be added to the fatty phase, the aqueous phase, and/or in lipidic spherules.

As regards the oils that can be used according to the invention, mention may be made of mineral oils (vaseline oil), vegetable oils (liquid fraction of karite nut butter, sunflower oil), animal oils (perhydrosqualene), synthetic oils (Purcellin oil), silicone-containing oils (cyclomethicone), and fluorinated oils (perfluoropolyethers). Fatty alcohols and fatty acids (stearic acid) can be added to these oils.

Emulsifiers usable according to the invention include, for

example, glycerol stearate, polysorbate 60, and the PEG-6/PEG-32/glycol stearate mixture sold under the trade name Tefose<sup>R</sup> 63 by the Gattefosse Company.

Solvents usable according to the invention include the lower alcohols, in particular ethanol and isopropanol.

As regards the water-absorbent gelling agents, mention may be made of carboxyvinyl polymers (carbomer), acrylic copolymers such as acrylate/alkylacrylate copolymers, polyacrylamides, polysaccharides such as hydroxylpropylcellulose, natural gums, and clays; and, as regards lipophilic gelling agents, modified clays such as bentonites and the metallic salts of fatty acids, such as aluminum stearates and hydrophobic silica.

The water-absorbent active ingredients include proteins and protein hydrolyzates, amino acids, polyalcohols, urea, allantoin, sugars and sugar derivatives, vitamins, and hydroxy acids.

The lipophilic active ingredients include retinol (vitamin A) and the derivatives thereof, tocopherol (vitamin E) and the derivatives thereof, essential fatty acids, ceramides, essential oils, and salicylic acid and the derivatives thereof.

Substance P antagonists may be combined, among other products, with active ingredients intended, in particular, for the prevention and/or treatment of skin disorders.

These active ingredients include, for example:

- agents modulating the differentiation, proliferation, and/or skin pigmentation, such as retinoic acid and the isomers thereof, retinol and the esters thereof, vitamin D and the derivatives

thereof, estrogens such as estradiol, kojik acid and hydroquinone;

- antibacterial agents such as clindamycin phosphate, erythromycin, antibiotics belonging to the group of tetracyclines;
- antiparasitic agents, in particular metronidazole, crotamiton, and pyrethrinoids;
- antifungal agents, in particular the compounds belonging to the imidazoles, such as econazole, ketoconazole, or miconazole and the salts thereof, the polyene compounds, such as amphotericin B, compounds belonging to the group of allylamines, such as terbinafine and octopirox;
- anti-inflammatory steroid agents, such as hydrocortisone, betamethasone valerate, clobetasol propionate, or non-steroid anti-inflammatory agents such as ibuprofen and the salts thereof, diclofenac and the salts thereof, acetylsalicylic acid, acetaminophen, and glycyrrhetic acid;
- anesthetic agents, such as lidocaine chlorhydrate and the derivatives thereof;
- anti-pruriginous agents, such as thenaldine, trimeprazine, and cyproheptadine;
- antiviral agents, such as acyclovir;
- keratolytic agents, such as alpha- and beta-hydroxycarboxylic and beta-ketocarboxylic acids, the salts, amides, and esters thereof, and, more especially, hydroxy acids, such as glycolic, lactic, salicylic, and citric acid, and, in general fruit acids, and n-octanoyl-5-salicylic acid;
- anti-free radical agents, such as alpha-tocopherol and the esters

thereof, superoxide dismutases, some chelating agents of metals, and ascorbic acid and the esters thereof;

- anti-seborrhea agents, such as progesterone;
- anti-dandruff products, such as octopirox and zinc pyrithione;
- acne-fighting products, such as retinoic acid or benzoyl peroxide.

Substance P antagonists are advantageously combined with active ingredients producing irritant side effects and widely used in the cosmetics field. The presence of an antagonist in a cosmetic composition containing an active ingredient producing an irritant effect makes it possible to attenuate, and indeed to eliminate, this irritant effect.

Accordingly, the invention also concerns a composition containing a cosmetically-acceptable medium and at least one active ingredient producing an irritant side effect, characterized by the fact that it contains a substance P antagonist.

In particular, the active ingredients exhibiting irritant side effects are chosen from among the  $\alpha$ -hydroxy acids, the  $\beta$ -hydroxy acids, the  $\alpha$ -ketonic acids, the  $\beta$ -ketonic acids, retinoids, anthralines, anthranoids, peroxides, minoxidil, lithium salts, antimetabolites, and vitamin D and the derivatives thereof.

The present invention further relates to a cosmetic treatment process characterized by the fact that a composition such as that described above and containing at least one substance P antagonist, in a cosmetically-acceptable medium is applied on the skin, hair, and/or the mucous membranes.

The cosmetic treatment process according to the invention can be implemented, in particular, by applying hygienic or cosmetic compositions such as those specified above, in accordance with method of use normal for these compositions. For example: the application of creams, gels, serums, lotions, make-up removal lotions or sunscreen compositions on the skin or on dry hair, application of a hair lotion on wet hair, shampoos, or application of toothpaste on the gums.

The invention also concerns the use of capsaicin for preparing a composition intended to identify sensitive skin, and a process for identifying sensitive skin, which consists in applying a composition containing capsaicin on the skin.

The following examples illustrate the invention. In these examples, the proportion indicated are ponderal proportions.

Example 1: Make-up Removal Face Lotion

Spantide II	5.00
Antioxidant	0.05
Isopropanol	40.00
Preservative	0.30
Water	qsp 100%

Example 2: Make-up Removal Face Lotion

Sendide	0.0001
Antioxidant	0.05
Isopropanol	40.00
Preservative	0.30
Water	qsp 100%

Example 3: Facial Care Gel

Spantide II	0.05
Hydroxypropylcellulose (Klucel H, sold by the Hercules Company)	1.00
Antioxidant	0.05



Isopropanol	40.00
Preservative	0.30
Water	qsp 100%

#### Example 4: Facial Care Gel

Sendide	0.04
Hydroxypropylcellulose (Klucel H, sold by the Hercules Company)	1.00
Antioxidant	0.05
Isopropanol	40.00
Preservative	0.30
Water	qsp 100%

#### Example 5: Facial Care Cream (oil-in-water emulsion)

Spantide	0.02
Glycerol stearate	2.00
Polysorbate 60 (Tween 60 sold by the ICI Company)	1.00
Stearic acid	1.40
Triethanolamine	0.70
Carbomer	0.40
Liquid fraction of karite nut butter	12.00
Perhydrosqualene	12.00
Antioxidant	0.05
Perfume	0.5
Preservative	0.30
Water	qsp 100%

#### Example 6: Shampoo

Spantide II	0.02
Hydroxypropylcellulose (Klucel H, sold by the Hercules Company)	1.00
Perfume	0.50
Preservative	0.30
Water	qsp 100%

#### Example 7: Anti-Wrinkle Facial Cream (oil-in-water emulsion)

Sendide	0.15
Glycerol stearate	2.00
Polysorbate 60 (Tween 60, sold by the ICI Company)	1.00
Stearic acid	1.40
n-octanoyl-5-salicylic acid	0.50
Triethanolamine	0.70
Carbomer	0.40
Liquid fraction of karite nut butter	12.00
Perhydrosqualene	12.00
Antioxidant	0.05

Perfume	0.50
Preservative	0.30
Water	qsp 100%

#### Example 8: Shampoo

Sendide	0.003
Hydroxypropylcellulose (Klucel H, sold by the Hercules Company)	1.00
Perfume	0.50
Preservative	0.30
Water	qsp 100%

#### Example 9: Emulsified Gel To Fight Insect Stings (oil-in-water emulsion)

Cyclomethicone	3.00
Purcellin oil (sold by the Dragocco Company)	7.00
PEG-6/PEG-32/Glycerol Stearate (Tefose <sup>R</sup> sold by Gattefosse)	0.30
Spantide II	0.02
Preservative	0.30
Perfume	0.40
Carbomer	0.60
Crotamiton	5.00
Glycyrrhetic acid	2.00
Ethyl alcohol	5.00
Triethanolamine	0.20
Water	qsp 100%

#### Example 10: Pain-Fighting Gel

Spantide II	0.03
Hydroxypropylcellulose (Klucel H, sold by the Hercules Company)	1.00
Antioxidant	0.05
Lidocaine chlorhydrate	2.00
Isopropanol	40.00
Preservative	0.30
Water	qsp 100%

#### Example 11: Anti-Acne Rosacea Face Cream (oil-in-water emulsion)

Spantide II	0.25
Glycerol stearate	2.00
Polysorbate 60 (Tween 60, sold by the ICI Company)	1.00
Stearic acid	1.40
Metronidazole	1.00
Triethanolamine	0.70
Carbomer	0.40

Liquid fraction of karite nut butter	12.00
Vaseline oil	12.00
Antioxidant	0.05
Perfume	0.50
Preservative	0.30
Water	qsp 100%

Example 12: Anti-Solar Erythema Cream (oil-in-water emulsion)

Spantide II	0.25
Glycerol stearate	2.00
Polysorbate 60 (Tween 60, sold by the ICI Company)	1.00
Stearic acid	1.40
Glycyrrhetinic acid	2.00
Triethanolamine	0.70
Carbomer	0.40
Liquid fraction of karite nut butter	12.00
Sunflower oil	10.00
Antioxidant	0.05
Perfume	0.50
Preservative	0.30
Water	qsp 100%